AFRICA TRADE and DEVELOPMENT

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AIRBORNE PROSPECTING IN AFRICA

by J. W. NORMAN, B.SC, ARSM, AMIMM, FGS

PROSPECTING AFRICA is a vast task that has been tackled on a piecemeal basis for some hundreds of years. It has been carried out by a combination of public and private enterprise and will probably continue on this basis for many years to come. All the work involves painstaking examination on the ground but the advent of the aeroplane has given means of speeding up of the search and special techniques have been developed to make it possible to outline the most promising parts of regions for detailed investigation.

It is obvious that the use of aircraft will accelerate movements of men and stores and in the vast distances involved in prospecting exploration any speeding up of movements is bound to increase the amount of work done in a season. Aircraft, however, have had other uses in field investigation and the ability to fly over ground and look at it has helped considerably in assessing the possibilities of broad areas.

Unfortunately, the human eye and mind are not trained to be able to make quick enough appraisals of landscapes and record them in an economic manner. As a consequence, aircraft are more normally used to transport recording instruments which bring back records of the ground over which the aircraft flies. The records can then be interpreted and studied in as much detail as necessary long after the actual survey flying has been completed. This digestion of data can take place in comfort and ideal surroundings with instruments and other facilities at hand in conditions that would be denied a field geologist. An aircraft carrying instruments can record sufficient data in a few days to keep a technologist busy for a year and it is now possible to have large areas reconnoitred by a contracting company employing a specialized scientific staff and having aircraft equipped for this purpose.

Probably the most important instrument is the aerial camera and many hundreds of thousands of square miles of Africa have now been photographed from the air. The photographs provide an invaluable asset to potential explorers and they can be arranged in the form of a mosaic which for certain purposes can be used instead of a map. As such these form a considerable aid to a prospector for whilst a normal topographic map may show him the main features of the country, such as roads, hills and railways, a photographic mosaic shows even individual trees and this fact will help to locate his position with greater ease.

The availability of vertical aerial photographs has led to the development of a new geological reconnaissance technique. By a study of the photographs with a stereoscope an experienced interpreter is able to assess the broad geological features of the landscape that has been photographed. Thus a preliminary study of the photographs shows a geologist the best places to go to secure data for a detailed ground geological mapping programme, and will help to avoid wasting a large proportion of his time on ground that would reveal no information. In addition the rock structure may also be detectable on the photographs and in some instances the rock type. However, to go into detail on these latter aspects it is usually essential for the geologist to visit the area and record on the ground the nature of the rock types in certain sample areas. Having chosen his areas carefully a few limited traverses will give him data to extend his interpretation over the whole of the area photographed. Working along these lines it is possible to plan a programme of investigation so that he can do his field work in the most propitious time of the year. By this means it is possible to produce reconnaissance geological maps of very large areas at a relatively low cost and to exploit short periods of suitable weather for field work. The geological maps in their turn will be of aid to the modern scientific prospector looking for specific minerals. By studying the maps he will be able to see in what particular parts of the country the geological environment is suitable for the occurrence of the particular mineral for which he is searching, and limit his work to those areas.

Aircraft can also carry geophysical instruments which will record continuously while the aircraft is flying a few hundred feet above the ground. These instruments can scan the ground systematically over large distances at something of the order of 100 miles an hour. The readings of the instruments are continuously recorded on charts which are linked to a small camera that records the aircraft's route. Thus at the end of a survey instrumental and photographic results can be compared to see which particular parts of the area have given interesting geophysical results.

Instruments which have been used extensively are mainly of three types. These show the changes of the earth's magnetic field, of the amount of radiation present, or of variations in the conductivity of the ground beneath the

The sale of AFRICA TRADE AND DEVELOPMENT to the countries of Africa has been increasing steadily. It has now become necessary to reorganize publication dates so that copies of each number can arrive in Africa during the month of issue. We are, therefore, publishing the July issue in June and this has made necessary the inclusion of a double issue, May-June, to bring forward the publication date. We hope that our readers will understand and we assure them that as from the July issue copies of AFRICA TRADE AND DEVELOPMENT will appear monthly.

aircraft. These data in a geologist's hands enable interpretations of rock features which are hidden by a cover of soil, or may lead to the detection of ore some hundreds of feet below the surface of the ground.

Magnetic surveys have been carried out over many thousands of square miles in northern Africa in order to locate areas suitable for the presence of oil. Although oil is not directly detectable by such means the magnetometer helps to show the depth below the surface at which old basement rocks occur and it is the configuration of this surface beneath newer oil-bearing sedimentary rocks that helps geologists to assess the possibilities of oil bearing structures being present.

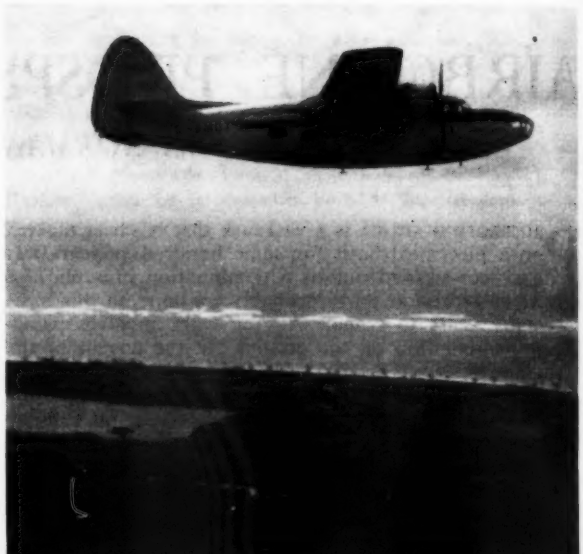
A magnetometer is also used for the direct detection of certain minerals with particular magnetic characteristics. However, where there are rock types present with a sufficient degree of difference in magnetic character, the magnetometer can be used to help in elucidating the geological structure of the ground beneath, even if there is an obscuring layer of soil, water or desert sand. Thus in certain cases where a required mineral is known to exist only in certain geological environments, a magnetic survey can be an indirect approach to finding this mineral in quantities by helping to find a suitable geological setting for its occurrence.

To a more limited extent carefully controlled airborne radio-activity surveys can also be used to help in solving regional geological problems, but a radio-activity survey is rarely used primarily for this purpose. It is one of the more direct forms of detection of specific minerals, and has been used to search for such radio-active elements as Thorium and Uranium in extensive areas in East and Central Africa.

Another form of airborne geophysical prospecting employs electro-magnetic principles to detect varying electrical conductivity in the ground below. The number of conductors that can be detected and occur in large quantities are limited, and they are usually either water, metallic sulphides, graphite or artificial steel structures. Of these metallic sulphides are usually the prize being sought by an electromagnetic survey and they include the most important sources of copper, lead, zinc, nickel and cobalt.

After all forms of geophysical survey, a final assessment has to be made by a geologist who will be best able to explain the nature of the physical variations in the natural setting in which they occur. Where such variations appear to be unexplained by rocks visible at the surface, then it has to be decided whether the evidence justifies some form of excavation or drilling to determine the cause of the interesting geophysical results. Drilling, pitting or sinking prospect shafts may help to turn a geophysical anomaly into an ore body worth mining or, may prove that the cause of the instrumental results to be something that is not economic. The cost of excavation and detailed sub-surface exploration is so great that it normally pays an exploring organization to apply all effective forms of geological and geophysical techniques to avoid becoming involved in heavy expenditure in places which the surveys can show to be barren.

The rate of exploration in Africa has been speeded up many times by the use of these modern methods, but the continent is so vast that there is still plenty to do. The old prospectors for gold and diamonds have covered large parts of the continent and in doing so have come across the more obvious promising ore bodies of these and other minerals. Future developments in exploration are therefore likely to be a further search for ore whose evidence is not so easily noticed at the surface, or possibly to find minerals which suddenly become valuable by changing demands in industry. An example of the latter is Uranium which not many years ago was merely a subject of academic interest but is now a valuable commodity and the cause of much new prospecting. The future of Africa is vitally involved with mineral exploration, for mining is one of the mainsprings of development in such a part of the world. The discovery of valuable deposits in remote places not merely stimulates the secondary industries necessary to such a venture as a large mine, but often pioneers transport services and communications which help to open up the country further to the farmer and other forms of business.



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GENERAL DEVELOPMENTS

US trade mission in Federation

Details of business propositions which the United States Trade Mission to the Federation have brought with them have been given in Salisbury by Mr. C. I. Blau, the mission's leader. Mr. Blau emphasized that the mission's job was not to sell goods. The propositions could be divided into five categories.

Importers were seeking Federal goods. Some manufacturers would be interested in coming to licensing arrangements with local firms. Others would be prepared to consider "joint venture" projects between themselves and local firms. There was also the possibility of two-way agency trade.

Mr. Blau said that the mission would prepare a write-up of trade opportunities compiled from approaches made by local business men interested in selling in America. This list of trade opportunities would appear in a US Department of Commerce publication. It was felt that although the market in Rhodesia was still quite small, there was potentially a good market.

The goods which US traders were interested in selling in the Federation included clothing, a wide range of industrial products, agricultural seeds, television receivers, fire-fighting equipment, micro-film, refrigeration machinery, air conditioners and petrol pumps. One firm was interested in entering a joint venture in developing kenaf.

New pipeline to carry Nigerian oil

Work has started on a new pipeline to carry oil direct to the coast from all the oilfields in the Eastern Region of Nigeria operated by the Shell-BP Petroleum Development Company of Nigeria Ltd.

The 12-inch diameter pipeline which is being constructed for Shell-BP by the African Construction Company, will run from the Bomu field, 35 miles east of Port Harcourt, to a new ocean tanker terminal at Bonny, at the mouth of the Bonny River. The 18-mile route of the line is through bush country and mangrove swamps. For the last ten miles the pipeline will be laid on the bed of the Bonny River where it will be covered by 70 feet of water at its deepest point. . To avoid corrosion it will be wrapped in fibre glass impregnated with bitumen.

When completed—probably in May this year—the pipeline will have an ultimate carrying capacity of over 80,000 barrels per day.

In the meantime, the terminal at Port Harcourt, 40 miles up river, continues to deal with oil produced at Oloibiri and in both the Bomu and neighbouring fields of Afam. Construction was completed in December of a 14-mile, 12-inch pipeline from Bomu through bush country north to Afam and there connecting with the original Afam-Port Harcourt Line. Built at a cost of some £250,000, its completion means that oil from the Bomu field no longer has to be brought partly by barge to Port Harcourt. When the direct line, Bomu-Bonny, is finished all production will be piped direct to the marine terminal at Bonny.

Additionally, £500,000 is being spent on the experimental dredging of the Bonny River bar to facilitate the export of the oil. It is hoped to open a channel deep enough to allow 18,000-ton tankers to pass fully loaded across the bar. At present, 9,000 tons is the biggest load that can pass.

Dredging of the bar is not expected to be concluded until later this year.

New pipeline for Nyasaland

It was announced in Nyasaland on 10 March that the Colonial Development Corporation was to lend £1,300,000 to the Mudi River Water Board for the £2,300,000 Blantyre-Limbe water scheme. The balance of £1,000,000 will come from the Colonial Development and Welfare Fund (£900,000) and the Nyasaland Government (£100,000). The CDC loan will be repaid over 20 years.

The scheme provides for water to be pumped from the Shire River through a 23-mile pipeline rising 2,567 ft. The new scheme, the biggest of its kind attempted in Nyasaland is expected to relieve the desperate water situation by December 1962. At first it will supply an extra 2,000,000 gallons of water a day to the Blantyre-Limbe and later up to 5,500,000 gallons a day. Eventually it could supply more than 11,000,000 gallons a day.

A £1,000,000 contract to supply the pipeline has been awarded to Stewarts and Lloyds of Rhodesia. The piping will be made in Britain.

Rhodesia-SA Trade talks

Discussions between the Governments of the Federation and South Africa on trade relations started in Salisbury on 14 March, it was officially announced on 8 March. The South African delegation was led by Mr. J. J. Kitshoff, Under-Secretary South African Department of Commerce and Industry. The Federal delegation will be led by Mr. J. Ward, Secretary for Economic Affairs.

Belgian aid

Belgium made a great effort in 1959 to help the Congo and under-developed countries, it allocated a subsidy of 2 billion 350 million francs to the Congo, in addition to a sum of 150 million which was drawn from the total of the tax returns; another subsidy of 200 million frs. representing the Colonial Lottery for 1960 was also granted, bringing the total subsidies for the Congo to 2 billion 700 million frs.

One billion francs have been entered on Belgium's special budget, this sum is intended eventually for constituting a Belgo-Congolese development company.

A subsidy of 750 million has been granted to Ruanda-Urundi, and finally, Belgium made a payment of 577 million francs to the Fonds d'Investissement des Territoires d'Outre-Mer du Marché Commun. (The European Common Market Overseas Territories Investment Fund.) Belgium's aid represents a sum of over five billion francs.

Railway Survey

A length of 52 miles of railway line in the northern province of Sierra Leone running between Marampa Copper Mine and Pepel Harbour is currently being photographed and mapped by Fairey Air Surveys Ltd of White Waltham, Berkshire, England.

The £12,000 contract, which was placed by the Sierra Leone Development Company Ltd, covers the mapping of the railway line to a scale of 1/1200 and the provision of cross-section drawings through the line and the adjacent terrain at frequent intervals along the whole of its length. Nearer the coast, at Pepel Island, large-scale surveys are to be made for development purposes. They will necessitate the clearing of sight-lines straight through mangrove swamp under conditions of great difficulty for the ground control survey team.

Ground control surveyors will be using a tellurometer, the latest electronic distance measuring equipment. It measures the distance between two points by means of modulated radio waves and has an accuracy of about 1/200,000.

Trade visit to Ethiopia and the Sudan

Following his visit in March to Egypt, as Leader of the British Trade Mission to the UAR, the Hon. H. G. Nelson (Managing Director of the English Electric Company Limited), visited Ethiopia and the Sudan.

The object of the visits is to assess trade prospects with these countries and to make personal contacts with Ministers, Government officials, and members of business communities.

Personalities

N. Cameroons administrators

It is announced that Sir Percy Wyn-Harris, KCMG, MBE, will be the Administrator of the Northern Cameroons when the Northern Cameroons is constitutionally separated from the Federation of Nigeria on 1 October 1960 in accordance with the United Nations General Assembly resolution of December 1959.

The Administrator of the Northern Cameroons will be responsible, under the authority of the Secretary of State for the Colonies, both for the administration of the territory, and for the organization of the plebiscite which the UN have recommended should be held there not later than March 1961, when the country will decide whether it wishes its permanent future to lie with Nigeria or with the neighbouring Republic of the Cameroon.

Sir Percy Wyn-Harris hopes to pay a preliminary visit to Nigeria in the next few weeks in order to meet the Governor-General of the Federation, the Governor of the Northern Region, and Ministers of the Federal and Northern Region Governments, and to see something of the Northern Cameroons.

It is also announced that Mr. Hubert Childs, CMG, OBE, is to be Administrator of the plebiscite to be held in the Southern Cameroons at the same time as that in the North and with the same questions. Mr. Childs hopes to visit the Southern Cameroons in April and will return there in the Autumn to supervise the plebiscite and its preliminary organization.

Mr. J. O. Field, CMG, is Commissioner for the Southern Cameroons and there the post of Commissioner and Plebiscite Administrator are separate because the Southern Cameroons already has the status of a quasi-region of Nigeria.

New Chairman for Nigerian Railways

The appointment of the London-based chairman of the Nigerian Railway Corporation, Sir Ralf Emerson, is to terminate on 31 May. The Council of Ministers decided that it was appropriate, in view of the approach of independence next October, for a Nigerian to be appointed.

Canadian to head Rhodesian TV

Gerry Wilmot, the former Canadian war correspondent, is to be general manager of International TeleVision, commercial managers of Rhodesia Television. Mr. Wilmot, who will arrive in Rhodesia in April, has 30 years' experience of broadcasting. International TeleVision is responsible for sales and programming for RTV's orthcoming commercial television operation n Salisbury.

New Union-Castle Line appointment

Mr. D. B. Lawrence, Assistant Manager of the Union-Castle Branch Office at Mombasa, has been appointed Assistant to Mr. D. R. Tilley, who is in charge of the group organization in Durban, and will take up his new appointment on arrival in Durban early in May.

Mr. Lawrence joined the Union-Castle in 1931 and commenced his service in the Cape Town Passenger Department. In 1935 he came to the United Kingdom for two years as one of the first Exchange Clerks, and on returning to South Africa, after a short spell in Cape Town, was moved to Mombasa.

He returned to Cape Town, and was then for some years Head of the Freight Department in East London. He was appointed in June 1956 to be Assistant Manager at Dar-es-Salaam and just over two years later Assistant Manager at Mombasa.

New director for Tobacco Research Board

Mr. I. Neas, director of tobacco research, has declined an invitation by the Tobacco Research Board of Rhodesia and Nyasaland to renew his contract when it expires in June. as he is anxious to return to the United States. The board has appointed Dr. K. McDonald as his successor.

Dr. McDonald is a well-known Rhodesian scientific worker, and his selection as the new director has been welcomed by all sections of the tobacco industry. In 1957 he was appointed senior agronomist and officer-in-charge of the Kutsaga Research Station and, since last year, he has been Assistant Director of the Research Board.

Liberian Consul-General, London

Liberia is to send Mrs. Myrtle Reeves Gorgla, who has served at various embassies, to London as Consul-General. She will join a woman consul who is already stationed there.

Publications Received

Rhodesia, published by Bailey Bros and Swinfen, Ltd. Price 24 shillings. An excellent collection of photographs of the Rhodesias. The colouring of the pictures is as vivid as the scenes deserve, without being exaggerated. A book to look at many times.

The Trail of the Copper King, by T. V. Bulpin and published by Howard Timmins, Cape Town and Bailey Bros and Swinfen Ltd and priced at 22/6. The story of Orlando Baragwanath and his fellow prospectors, this book is a revealing commentary on the opening up and development of much of Southern Africa. Whether it is intended to be so revealing is another matter. Mr Bulpin tells the tale well and holds the reader's interest.

Animals of Southern Africa, by Astley Maberly. This is a little book full of fascinating information about the more interesting animals of Southern Africa. It is not intended to be comprehensive but is meant to serve as a guide for the visitor to the National Parks and Game Reserves of Rhodesia. Some of the descriptions are very amusing—"Hippopotami sleep in heaps, one head upon another", and the drawings are quite illustrative. The book is priced at 15 shillings.

Spoor of Blood, by Alan Catterick. Although this book, with its description of the wholesale slaughter of animals during the opening up of South Africa, is not for the squeamish, it is almost a memorial to the early hunters. One of the few redeeming features in the whole sad history, is the founding of the Kruger National Park. This book is published by Bailey Bros and Swinfen Ltd and priced 21 shillings.

Saben's Commercial Directory and Handbook of Uganda, 1960-61, published by Saben's Directories, Kampala, Uganda and priced 30/-. It is hoped that this directory will re-appear in a year or two, as it is bound to be of great value to all who have anything to do with Uganda. The commercial section is particularly good. General information covers almost everything from agriculture to workmen's compensation; from cable rates to titanium.

South Africa, published by Howard Timmins, Cape Town, and Bailey Bros and Swinfen Ltd and priced 63/-. This pictorial record of South Africa covers many aspects of the country. There are some very fine photographs of the countryside and of various industries. The introduction is by T. V. Bulpin.

Iron Ore in Mauritania

IN MARCH 1960, the World Bank made a loan equivalent to US $66 million for the development of high-grade iron ore deposits in the Republic of Mauritania in North-West Africa. The project will open up completely new opportunities for economic growth in Mauritania, where the severity of natural conditions narrowly limits expansion of the traditional agriculture and livestock raising. Revenues from taxes and royalties should dramatically reverse the present chronic budget deficits and provide Mauritania with a unique opportunity to become self-supporting.

Mauritania is an autonomous republic within the Community established by the French Constitution of October 1958. It is twice the size of France and extends north and north-eastwards from the Senegal River into the Sahara. The country is desolate, barren and empty and the climate is hot and dry. Regular rain is limited to the southern regions where the total fall is 10-25 inches annually. It is flat except for a central ridge of low rock formation and the small scattered population numbers between 650,000 and one million.

The economy is primitive and the average level of income is among the lowest in West Africa. About 90% of the people live on a subsistence basis. During the rainy season the arid plains become immense grazing grounds where the greater part of the population live with and by their herds, drifting southwards in the dry season in search of food and water and trading live animals and livestock products for cereals and other basic necessities.

Settled agriculture is confined to scattered oases and the north bank of the Senegal River; a limited area has been added through irrigation. The main crop is millet, of which some 80,000 tons is harvested. Peanuts, fruit and vegetables are also grown but vegetables are the only product traded in any quantity. The fishing grounds off the coast are said to be very rich. But the key to Mauritania's economic development lies in the country's mineral resources, notably the iron ore deposits near the old military post of Fort Gouraud which are now to be mined.

The loan was made to the Société Anonyme des Mines de Fer de Mauritanie (Miferma), a Mauritanian company whose share capital is widely held. Somewhat over half the shares are held by French, British, German and Italian consumers of iron ore or their representatives, who have signed long-term contracts to purchase at least three million tons of ore a year. The remaining shares are held by private French financial interests (20%) and by an agency of the French Government responsible for mineral exploration and development (27%).

The loan will help to finance equipment and services to mine ore at a rate which would eventually reach six million tons a year; construction of a 415-mile (675-km) railway to transport the ore from the mines to Port Etienne on the Atlantic coast; and construction of port and other facilities.

The iron ore deposits are located in a low mountain range, known as the Kedia D'Idjil, which rises 1,800 feet above the Saharan plain. Open pit reserves are estimated to be about 115 million tons with an average shipping grade of 63%; the ore is similar to high-grade Swedish and South American ores. It will be mined by conventional open-pit methods and shipped after simple crushing.

The ore will be transported to Port Etienne in long heavy trains, carrying 10,000 tons on a single trip. Facilities to be installed will make it possible to load or unload a train in three hours. Each train will be made up of about 135 wagons, headed by four 2,000 hp diesel-electric locomotives, and will have an average operating speed of 40 miles (65 kms) an hour. The 415-mile (675-km) railway will be a single track, standard-gauge line with heavy rails welded throughout and will traverse open desert. The movement of trains will be controlled by radio.

The main bay on which Port Etienne is located is well protected and has deep water close inshore. The new port facilities will provide berthage for ships of up to 60,000 deadweight tons. Storage will be provided for the stockpiling of about 650,000 tons of ore so that shipments can be maintained during the four hottest months of the year when mining operations will be cut 50%. The initial capacity of facilities for loading ships will be 3,000 tons an hour, with provision for an increase to 6,000 tons.

Because of the isolated location of the deposits and of the port, Miferma will provide housing and community facilities, workshops, water and power supplies at both Fort Gouraud and at Port Etienne. When the mine, railway, port and auxiliary services are in full operation, Miferma will employ about 2,000 people, of whom about two-thirds are expected to be recruited locally. A training centre will be set up at Port Etienne to assure that skilled Mauritanians will be available for the operational period. The new town to be created at Fort Gouraud may have up to 3,500 inhabitants, and the population of Port Etienne, now a small fishing village, may rise as high as 10,000, if the other investments, which it is hoped the presence of Miferma will stimulate, are carried out.

Work on the port and the railroad is scheduled to start soon. The railroad is expected to take about four years to complete, but mining operations will start in about two years in order to build up a stockpile of ore ready to be shipped as soon as the railroad is through. At that time the mine and railroad will have a capacity of four million tons a year, which will be increased thereafter to six million tons by the installation of additional mining and transport equipment.

The cost of the completed project is estimated at the equivalent of $190 million. To reach the four-million ton stage will require about $150 million, which will be financed by share capital and loans from the French Government in addition to the Bank loan of $66 million. The equivalent of $40 million required to increase capacity to six million tons a year is expected to come from funds generated by operations. Procurement of goods and

(Continued on page 11)

Western Nigerian Natural Resources

In 1959 a white paper was placed before the Western Regional Regional Legislature which dealt with the future policy of the Ministry of Agriculture and Natural Resources.

Under this Ministry are grouped Agriculture, Forestry, Fisheries and Livestock, and it is considered that a full review has become necessary in the light of internal and external events.

In the 1960/65 Western Regional Development Plan which was passed through Parliament during the first week of April 1960, primary production, which includes all of these headings was allocated £13,806,000, the largest sums being allotted to the Co-operative Farm Settlements £4,960,000, the continuation and extension of existing plantations £2,200,000, tree crop production programmes £2,000,000, and credit facilities for primary production £1,250,000.

The major crop in acreage in the Western Region is palm oil. The domestic consumption of palm-oil has remained steady but the figure for exports has declined over the past year or so and steps are to be taken to attempt to regain a balance. Between 1960/65 the Ministry plans to distribute some half a million palm-oil seedlings annually. Seedlings are reared in the agricultural nurseries belonging to the Ministry, the cost price being one shilling per seedling but the cost to the farmers has been reduced to three pence. At this price farmers can afford to plant good quality stock which gives a high yield and also to restock land which has become economically unproductive.

Nigeria's agricultural economy is based on tree crops which take, sometimes, up to seven years to mature, but once bearing have a comparatively long life with high yields. With the advance of research and the crossing of species it is now becoming possible to reduce this gap and produce plants which will yield in about half the time, thereby making it far easier for the farmer to recover his initial outlay.

Cocoa is the main cash crop and on its export much of the economy depends. The soil and the climate are admirably suited to its growth and it is hoped to increase the present acreage. Again there is a gap between planting and yielding but successful experiments have narrowed this down to four and in certain types to three years. Cocoa trees, while still productive, fail to give the full yield after a certain age. If these trees were removed and the ground replanted production from the same acreage could be increased. As with oil palms, cocoa seedlings are distributed to the farmers, the price being reduced from eight pence to two pence. In 1959 six million seedlings were supplied for distribution and it is expected that from 1961 onwards ten million will be available annually. Farmers are to be encouraged to establish their own nurseries and the aim is for private nurseries to produce up to six million seedlings annually.

As one travels through the western part of the region the cocoa trees with their variegated soft green and red leaves are ever present, but the rather haphazard method of planting does not tend to yield the harvests which could otherwise be obtained from planned planting. This is now being realized and in future cocoa will be planted with this in mind. All possible assistance is to be given to the farmers to show them the best methods of planting, although the Government will not interfere with private farmers using their lands as they wish. Co-operative cocoa farms are to be encouraged and these would work in conjunction with the Local Government Councils, the Co-operative Movement and the various organisations for community development.

It is generally considered that the world cocoa market could absorb one million tons of raw cocoa at good prices to the producers. Western Nigeria is trying to increase its share of the total world production.

Nigeria is now the largest area under rubber of any African state. This is widely grown in the Western Region. In 1958 there were 359,000 acres of rubber and the production was 36,712 tons. By 1959 the acreage had increased by approximately 10 per cent and the production was 47,504 tons.

Rubber plantations are controlled by large commercial firms, but smallholders, especially in the west are also growing rubber. Here again the same facilities are provided for buying seedlings at a considerably reduced price, from one shilling and six pence to one and a half pence per seedling. The demand is for high yielding varieties to meet the competition from synthetic rubber and indiscriminate tapping is to give way to more carefully regulated production.

Over two and a half million clonal seedlings per year are to be distributed from 1960 onwards and it is estimated that with about eighty per cent of these surviving and planted at two hundred trees per acre, 10,000 acres of this newly planted rubber, with proper treatment, should be capable of yielding sixty per cent more latex per year.

Care is to be taken to ensure that the seedlings are planted and attended to properly and during the past eighteen months some 26,000 planters have been trained in the methods of tapping and processing. Advice is to be readily available to planters and it is claimed that there is no plantation in the Western Region more than five miles from a representative of the Ministry.

The proper training in cultivation and business methods of the producers may be of the greatest importance to the future prosperity of the industry. This was emphasised in a recent interview by Mr. Okwechime, Manager of the Western Nigerian Development Corporation factory at Ikpoba, near Benin. The factory produces some one hundred and twenty tons of crepe a month from latex supplied in the form of "lumps" by the planters. These "lumps" resemble large loaves of bread and in order to increase their weight and hence their price the planters have often been discovered to have inserted foreign matter such as wood, metal scraps and stones in them. This practice is very destructive to the milling machines apart from involving the Corporation in heavy financial losses.

When the factory opened in 1955 sheet rubber was manufactured because this fetched a better price in the open market. However, the excessive adulteration of the latex did not make this a paying proposition and the factory had

to turn to the production of crepe instead. The standard of the crepe now being produced is high despite the difficulties experienced and can compete successfully in the world markets. Most of the production of the Ikpoba factory is sent to London or New York.

There would seem to be two possible answers to this problem. Latex could be produced only from large organized plantations where a careful watch could be kept to ensure the absence of foreign matter. The alternative, which would be a costly business in a country such as Nigeria with a scattered and still largely illiterate population, would be for steps to be taken to educate the farmers, and possibly their children, that adulteration is a criminal act and highly detrimental to the trade of the country. Poor grade latex can give Nigerian rubber a bad name abroad and lose sales which would benefit the people as a whole.

No system of subsidies or grants to farmers has been considered to try to raise the standard of latex, nor, up to the present, have heavy penalties for adulteration been levelled in the courts. It is questionable whether, even if they were, the effect would be very widespread as few of the farmers can read newspapers.

One thing is certain that some means of spreading the knowledge of better production must be found if the standard of latex is to be raised. When this is accomplished the standard of sheet rubber or crepe should in turn automatically rise.

The future of rubber production could be a bright one, the crop is now gaining a hold and everything possible should be done to assist its progress.

One of the new schemes now being started in the Region to try to improve farming is the development of Co-operative and Communal farms. This aims at making modern farming attractive to young men who would otherwise, after leaving school most probably gravitate to the towns where wages are generally higher and living conditions better, rather than remain in the villages where farming is still carried on by traditional methods entailing a great deal of hard toil.

The Co-operative farms will be 1,500 acres in size with reserves of 5 to 6 thousand acres for possible future expansion. Each settlement will have fifty settlers initially, with room for another one hundred and fifty and each settler will have at least twenty-five acres to begin with. A full survey of each settlement will be carried out and in the first instance the Government will provide accommodation and essential farm buildings. It should be the aim of each settler to establish his farms as quickly as possible. Machinery and technical assistance will be made available and the settlement will be under the supervision of a Manager who during the first few years of the scheme will be a fully trained officer of the Ministry of Agriculture.

Crops will be chosen to suit the land in the respective areas and the use of machinery will be encouraged to the fullest. Some of the advantages offered by the scheme include credit and marketing facilities and training in agricultural methods. This will benefit not only the actual settler and his family but indirectly the country as a whole.

During 1960 it is hoped that sufficient bushland will have been cleared for the first twelve Pilot Settlements and that the actual planting of the first areas of cocoa, rubber and citrus will begin. Palm-oil planting may have to be held over until 1961.

It is not possible to deal fully in this article with the whole organisation of the Co-operative farms, but it must be stressed that the whole venture is estimated to cost over £1 million annually for the next five years. Taking into consideration that this figure represents only one per cent of the annual national income and that the scheme when fully in operation is likely to raise the current agricultural production by over one per cent it seems a sound investment.

For many years to come agriculture will be the chief industry of Nigeria and mechanization is being speeded up. But there are many problems that will have to be tackled, as will be shown in future articles, before any great advance is made in the general economy. One hopeful sign, however, and particularly in the Western Region is in the rising generation, which having had a good primary education seems more amenable to modern methods of farming. Moreover, they would be able to understand the necessity for applying these methods and this would, indeed, be a great step forward.

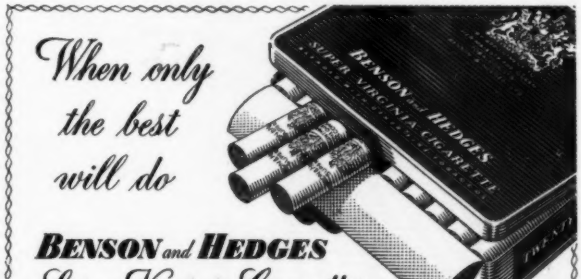
It is hoped to deal with the other spheres of activity in Nigeria such as livestock raising, fisheries, forestry and research in successive articles.

(Continued from page 9)

services will be on an international basis to the fullest extent practicable.

The loan is for a term of 15 years and bears interest of 6¼% per annum including the 1% commission which is allocated to the Bank's Special Reserve. Amortization will begin in January 1966 and the loan is guaranteed by the Republics of France and Mauritania.

In comparison with the present economy, the Miferma project is immense. An investment of perhaps six times the national income with a potential production of iron ore at least five times as great in value as all exports now traded. The port and mine townships should be important new markets for livestock and fish, but elsewhere the traditional economy would not be directly affected. The Miferma project is expected to expand the Government income very considerably. In the first year of operation, export and profit taxes together should yield 1,000 million francs CFA (US$ 4 million), and within a few years, more than 2,100 million CFA. The Government expects the growth in revenue will outstrip the prospective rise in public expenditure and bring about a rapid improvement in public finances.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GOODS and SERVICES

We have been asked to make the following amendment to the article appearing on page 17 of the March-April issue, fourth paragraph:

For instance, on the West African routes BOAC have daily flights leaving London Airport flown by Britannia jet prop aircraft. These arrive in Lagos or Accra from 12 to 16 hours after leaving London according to the route taken. The journey to Johannesburg from London by Comet 4 jetliner, nearly 6,000 miles, takes between 18 and 20 hours according to route. To Johannesburg by South African Airways DC-7B takes slightly longer—25 to 27 hours according to route.

US buys Rhodesian chrome

Southern Rhodesia has replaced Turkey as the United States' biggest supplier of chrome, 50.1 per cent of the market, according to the 1959 report of the Director of Mines.

The base mineral reserves of Southern Rhodesia continue to attract the interest of the large exploration companies of South Africa and other parts of the world, including Japan.

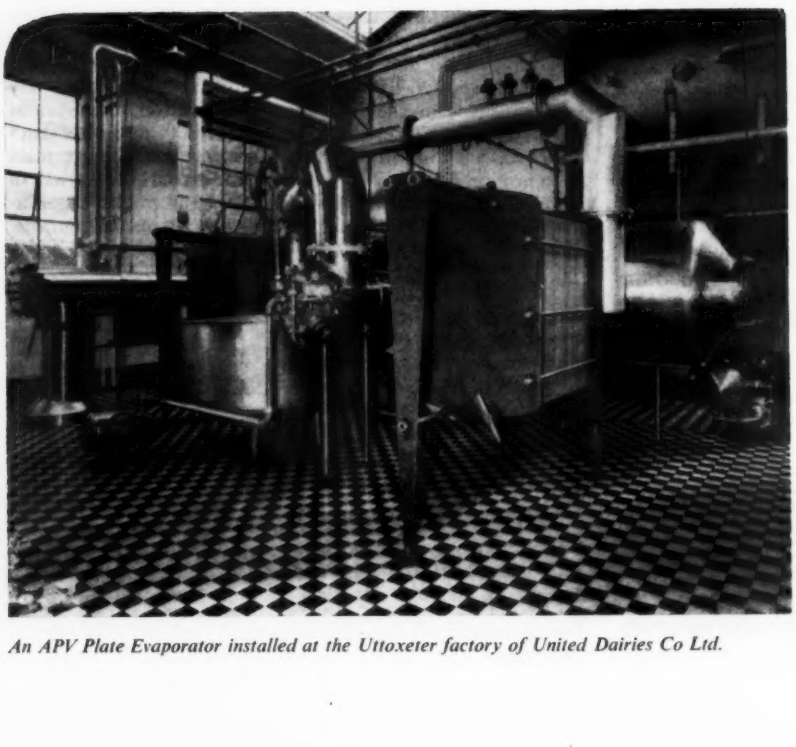
Interest in copper had been stimulated by the outstanding progress achieved at Mangula. The discovery of emeralds in the Belingwe district continued to attract worldwide interest. The stones produced had been small, but world authorities were agreed that their quality was superb.

Increased freight allowances

The Union-Castle Line have announced that they, together with other Lines serving Africa, have standardized their free baggage allowance for First, Cabin and Tourist Class passengers at 40 cubic feet for all adults and 20 cubic feet for all fare-paying children under twelve years of age.

In the case of Tourist Class adult passengers the new allowance represents an increase of 15 cubic feet.

It was also announced that the allowance on the combined out and home freight on passengers' cars has been increased to 20 per cent. The allowance has been doubled to assist and encourage the travelling public to take their cars overseas.



An APV Plate Evaporator installed at the Uttoxeter factory of United Dairies Co Ltd.

World Bank loan to S Rhodesia

Negotiations for a £2,000,000 loan to assist in the implementation of Southern Rhodesia's African Land Husbandry Act have been concluded in Washington. The negotiations were conducted with the World Bank by the Rhodesian delegations headed by the Assistant Secretary to the Federal Treasury, Mr. Campbell Ballingall. The agreement now has to await approval on both sides—at the World Bank it has to be considered by the board of executive directors and in Rhodesia by the Southern Rhodesia Government.

Tobacco Export Promotion Officer appointed

The Tobacco Export Promotion Council of Rhodesia has selected Mr. R. C. Macfarlane, senior Under-Secretary of the Federal Ministry of Commerce and Industry, to fill the newly-created post of senior market promotion officer. He will assume his new duties on 1 May. Mr. Macfarlane's appointment will strengthen the Federation's tobacco sales drive considerably.

Training classes at Rootes factory

A spokesman for the Rootes Group announced in Salisbury on 10 March that training classes for Africans would start in June in the firm's new £250,000 plant which opened in Salisbury on 11 March. Africans would not emerge qualified motor mechanics but would be given a thorough knowledge of servicing and maintenance techniques of all motor vehicles. Africans in this course would all be employees of Rootes franchise holders.

A new type of evaporator for Africa

Through their agents in Johannesburg, Messrs Rogers Jenkins and Co Ltd, the APV Company Limited of Crawley, Sussex have, in recent months, sold a second plate evaporator to South Africa. The plant concerned is for Stein Brothers of Johannesburg, and will be used for the concentration of skim milk from 8 per cent to 45 per cent total solids.

Operating on a single pass climbing and falling film principle, this revolutionary new type of evaporator uses an arrangement of plates in place of the conventional tubular calandrias, thus providing substantial savings in height (it is under 9 ft. high), and other important advantages, particularly in connection with its treatment of heat sensitive liquids.

Three other sales of plate evaporators made to the African continent since the plant's introduction in 1957 include two citrus juice evaporators, one to South Africa and one to Morocco; and a skim milk evaporator to the Dairy Marketing Board of Southern Rhodesia for their Gwelo factory.

The photograph shows one of the new APV plate evaporators installed in a milk factory in England.

COFFEE IN ETHIOPIA

ETHIOPIA IS BELIEVED to be the birthplace of the best known species of coffee, which still grows wild in narrow valleys in the south and west. It has been cultivated for centuries in the forests of that region. Indigenous plants in Kaffa province have been tended and cropped for centuries according to ancient methods and traditions, and there is little doubt that the cultivation of *arabica* coffee started in that province. Ethiopia was probably the first country to use coffee as a food and as a beverage. Not only the beans, but the whole fruit, pulp and leaves have been prepared for human consumption. The fruit is usually cooked in butter to make salted flat cakes. The green berries also are roasted, ground, salted and mixed with butter for the same purpose. The fresh skin of the fruit is sometimes used as a vegetable, and the ground roasted seed as dessert. The roasting of coffee beans is of ancient usage; the beans after being ground are mixed with Aframomum, cloves and other substances to make an aromatic infusion.

Specialists in the history of Ethiopia say that Ethiopians in the 13th or 14th century A.D. introduced coffee into the Yemen where it was cultivated in the mountain areas. It was only from the 17th century onwards that the *arabica* coffee of Ethiopia was introduced to ecologically favourable areas in Asia, Africa and America. Many well-known varieties are derived from this coffee.

Coffee is one of the mainstays of the Ethiopian economy and revenue from it is an important item in the budget. In recent years it has represented 55 to 60% of the total exports. Not all the total production is exported, as a large amount is consumed locally. In Addis Ababa alone the annual consumption is estimated to be 1,200 tons. There is a large demand for the dried pulp of coffee berries, and this has a fairly high market value.

According to their market value, the coffees of the various provinces are classed in the following order: Harar, Wollega, Illubabor, Kaffa, Sidamo-Arussi and Gamu Gofa. This classification is based on aroma and taste, and also on the method of processing the coffee at the source. Ethiopia could undoubtedly increase its coffee production and exports by establishing large organized plantations, by rational utilization of the existing coffee forests, and by encouraging the people to set up small individual plantations. Exports of coffee from British territories in Africa increased from 8,400 tons in 1920 to 65,000 tons. Likewise, exports from the Belgian Congo and Ruanda Urundi increased from 1,000 tons in 1929 to 36,000 tons. These examples show what can be accomplished.

Samples of Ethiopian coffee, properly processed, were tested for quality by experts of the Ruanda Urundi Coffee Office and of the Kenya Coffee Board. These tests showed that Ethiopian coffees compete with the best coffees produced in other parts of the world. When properly prepared, Ethiopian coffee has a bluish to greenish colour, the roasted bean is shiny, the liquor is clear, slightly acid and light bodied. Particularly worth mentioning as quality coffees are the superb "Ennarea" of the coffee forests in the Limmu District, the "Blue Mountain" type of the Kaffa-Jimma groves, the "Moka" of the private plantations in Sidamo and the "Bourbon" of Harar and Arussi.

In the south-west of Ethiopia, comprising the provinces of Kaffa-Illubabor and Wollega, the ecological conditions in large areas at elevations ranging from 1,600 to 2,000 metres, are especially favourable for the growing of coffee. The soil and climatic conditions are such that high-grade coffee can be grown at production costs lower than in most other parts of the country. In other districts, also, climatic conditions are favourable, and where irrigation can be easily practised, coffee can be grown successfully.

In the Kaffa-Jimma and the Sidamo provinces and in the Lake Tana district, there are large well-established plantations with and without shade. In the Arussi and Sidamo provinces and in the Chercher District in Harar Province, plantations have been laid out according to improved methods. There are many small unshaded plantations in Harar Province, many of which are irrigated and excellently tended. The plants are not pruned regularly, but are rejuvenated every 15 to 20 years by being cut back. Small family plantings can be seen near dwellings in many parts of the country, and particularly in the provinces of Kaffa-Jimma, Sidamo and Shoa. The best altitude for coffee is from 1,500 to 1,900 metres. Lower altitudes increase the virulence of certain fungus diseases, and especially of *Hemelaia vestatrix* which can be very destructive.

The soils best suited to coffee consist of a mixture of sand and clay, rich in humus and not degenerated through erosion or impoverished by intensive cropping. Many forest soils are ideal. The rainfall should be abundant and regular. Dry periods should not be very marked or excessively long and, consequently, the establishment of plantations in Harar, Arussi and Shoa cannot be recommended unless planned irrigation is possible. Profitable plantations could be laid out in the provinces of: (a) *Kaffa-Jimma*, in the regions of Jimma, Limmu, Agaro, Bonga, Wushhush and Mizan Teferi; (b) *Wollega*, in the regions of Lekemti, Ghimbi, Dembi Dollo and Anfilo; and (c) *Illubabor*, in the regions of Matu and Gore.

On the high plateau the dry season starts in early October; it seldom rains during the last quarter of the year and January is often dry. At the end of February there is a small rainy season lasting several weeks and this is the principal flowering period for the coffee trees. Then follows a short dry season broken by infrequent showers. The heavy rains start during the first half of June, and showers are a daily occurrence. In July, it often rains during both morning and night, and in August and September the rain falls fairly steadily day and night. In the regions most suitable for coffee growing, and particularly in the provinces of Kaffa-Jimma, Illubabor and Wollega, rain falls at all times of the year. The climate is sub-temperate throughout the year, the temperature seldom rising above 30°C. and never falling below 5°C. The nights are usually cool and during the dry periods an abundant dew condenses

(Continued on page 16)

Fibre Processing Machines

A range of machines for processing raw fibres into useful products has just been announced by A. E. Callaghan and Son Ltd, Pytchley House, Market Square, Midhurst, Sussex, England. These machines handle such fibrous materials as sisal, coir, rami and asbestos, so they are of particular interest to Eastern, Western and Central African territories for making industrial use of readily available raw materials.

Of particular interest is the electrically operated machine known as the Midhurst Opener. Raw fibrous materials are fed into this machine, broken down into long individual fibres and blown out into a collection area. Alternatively a condensing roll can be added to the Midhurst Opener so that the fibres are delivered in the form of continuous padding, 40 in. wide. The Midhurst Opener costs £1,800 ex-works, and the condenser unit (if required) a further £816 ex-works. A hopper feed for the machine can also be supplied.

Some of these finished materials are finding widespread use for packaging while others can subsequently be treated with latex or resins for conversion into bonded pads, webs and fabrics.

A. E. Callaghan and Sons Ltd, also manufacture fibre amalgamating machines which are developments of the Midhurst Opener. These fibre amalgamating machines have a hopper for the raw material, opening cylinders for converting this material into individual fibres, condenser rolls for collecting the fibres in the form of a continuous pad of either 40 in., 60in. or 80in. width, an impregnating and dyeing unit, and a curing oven. These units are built up into one complete machine so that the raw fibres enter at one end and a strong finished material emerges at the other.

The Birfield-Callaghan Midhurst opener showing the continuous belt on which raw fibrous materials are fed before being drawn into individual fibres

Rhodesian-Japan trade agreement

An agreement was recently signed between Rhodesia and Japan. Under the arrangement the Federal Government will licence the import of some 15 commodities, mainly for industrial use, from Japan, and these will enter at the same rates of customs duty as apply to goods from other foreign countries which are members of the General Agreement on Tariffs and Trade.

In return, the Japanese Government will grant similar facilities for some 18 important Federal exports, including tobacco, chrome, asbestos, hides, tung oil, cotton seed, wattle bark and extract, beans, peas and lentils, maize, soya beans, miscellaneous animal products, ores of manganese, beryl, iron, lithium and nickel and pig iron.

Guinea-Hungary agreement

The 1960 agreement with Guinea provides for Hungary to supply industrial installations, telecommunications instruments, vehicles, and various consumer goods, in return for palm seed, iron ore, industrial diamonds, and citrus fruits.

Hungarian exhibition in Guinea

The first Hungarian trade exhibition to be held in Guinea closed with orders worth £50,000. The exhibition was organized by the Hungarian trade organization Ferunion.

A Perkins-engined, 40 ft. aluminium alloy survey and patrol launch has been designed and built for the Belgian Government by Universal Shipyards (Solent) Ltd for service on Lake Tanganyika. The craft, which has an 11 ft. 6 in. beam and 2 ft. 9 in. draught, was shipped to Africa at the end of February and then had a 1,200-mile rail journey from Lobito to Lake Tanganyika.

She will be employed on survey and patrol duties on the lake.

The launch is fitted with two Perkins P6 marine diesel engines, each developing 65 shp at 2,000 rpm and operating through direct drive oil-operated gearboxes. On trials, she achieved a maximum speed of 15 knots.

The craft has a rivetted hull and there is a forward saloon where settees can be converted into sleeping berths, an enclosed wheelhouse and a large open cockpit aft with seating accommodation. Accommodation includes a small galley.

By Road from Kano to Lagos

by E. M. Bird

THE ROAD FROM KANO TO LAGOS runs down the full length of Nigeria, from within a hundred miles of the border with French Sudan to the Gulf of Guinea. It stretches for approximately 700 miles and is long, hot, dusty and tiring but rewarding.

Kano is the chief commercial city of the north. The airport is modern and active and the runways are now in process of being lengthened to enable jet planes to land. This is temporarily inconvenient to visitors, but the completion of the work will bring Nigeria even nearer to Europe than it is at present.

The city is divided into the new and the old. The old walled city contains the Emir's palace among the mud-walled huts of the population. The wall is of mud and has now fallen in many places, leaving gaps as if it had been shelled.

The mud houses are painted with designs or whitewashed against the sun. The mud of which they are made is caked into small hand-formed round bricks which are then built up into a wall with liquid mud. After the rains the walls have to be repaired but the roofs generally last for two or three years before complete or extensive repairs become necessary. Most of the houses have at each corner turrets resembling tiny minarets. When a man obtains a new wife, and under the dominant Moslem religion each is allowed four, a new room is added to the original structure. The roofs are used for storing hay or other foods for the ubiquitous goats which wander seemingly ever pregnant, through the town.

The Sardauna of Sokoto is the ruler of the Northern Region. He is the spiritual head of the Moslem population and holds power over the entire region. It is he who decrees the date on which the fast of Ramadan shall end. This is a movable date and depends on the rising of the moon. This year, as the moon was seen to rise on Monday, 28 March, the national holidays were announced for the 29 and 30 of March.

The celebrations proclaiming the end of the fast are known as the Salla. This consists of a procession of horsemen who accompany the local Emir of each town. The horsemen then pay their homage to the Emir, which takes the form of advancing at full gallop, stopping short, and saluting with their spears. The whole procedure is a mass of colours, with the reds and greens of the Emir's guards and the dresses of the camelmen vying with the glorious robes of the local chiefs and nobles and the chain mail which is said to have been passed down from father to son since the time of the Crusades.

From Kano to near Kaduna the road is tarred and comparatively easy to travel. All tarred roads have a central strip, with a wide strip of laterite on either side onto which the overtaking traffic can drive. This laterite is the red soil of the bush, cleared and compacted. It forms the surface of most of the roads in the centre of the country and in dry weather sends clouds of red dust flying up behind vehicles, showering bystanders and passengers alike with a film which penetrates into cases, clothing and equipment.

However, despite the hazards, it makes a passable road surface over which it is possible, in fact advisable, to drive at speeds of between 45 and 50 mph. This seems foolhardy but is in actual fact better, especially with a wide-based car, which will go over the various undulations instead of through them, thus giving a smoother, though a more precarious ride.

The Northern Region is brown and consists largely of sparse, dry and virtually barren bush, which during the rainy season, springs to life and provides fodder for the cattle. As one moves south this gradually changes into savannah lands, with tall grass, a larger number of trees, small shrubs and an occasional, nearly dried-up river. Again there is a gradual change until at Jebba, the river Niger is crossed and the sides of the roads then begin to close in with a mass of undergrowth as the tropical rainbelt of the coastal region becomes permanent. Here grow the oil palms, coconut palms, banana palms and a mass of creepers and thick green lush plants. The air becomes humid and the temperature, which is actually lower than in the north seems to rise and becomes oppressive.

March and early April are the hottest months of the year, just prior to the rains, which begin during the first week of April but which do not reach their peak until June or July.

The main town and capital of the Western Region is Ibadan. Here sits the Parliament of the West consisting of the Houses of Assembly and the Chiefs. In the House of Assembly there are 80 elected members and in the House of Chiefs 54 Chiefs and 2 appointed members. The building is new and the actual chambers are divided, except for the outwall, by a lattice frame which allows for a free passage of air. It is a pleasant building and is air-conditioned. The Ministries are adjacent to the Parliament building but are housed in individual blocks.

Ibadan, like all Africans towns of the West, is a town of contrasts. Modern European-type houses inhabited either by African or European families are found in the outskirts of the town; in the centre are the African trading streets, consisting of innumerable small shops on the pavement selling all manner of merchandise. The dominant colour is blue, this being the usual colour for garments and it is quite common to find many different shades, ranging from navy to a particularly striking sky blue worn by the same person. As in the Northern Region the goats are everywhere. A special section of the market is given over to the buying and selling of these goats, which are small and active and seem to thrive on everything.

A most interesting and an unusual sight in Africa are the television aerials of Ibadan. In fact, Ibadan proudly claims to be the first town in the whole of the continent to have them. WNTV transmits every evening and also gives

an hour of educational broadcasts during the day. Programmes are varied and the reception, speaking only from experience in the immediate neighbourhood of Ibadan, is quite good.

Lagos, on the Gulf of Guinea, lies another eighty odd miles to the south. It is primarily a port with extensive docks on one side. It lies on a series of islands which are joined to the mainland by wide bridges. The bank opposite the docks contains the shopping centre and the larger general trading firms and banks. Parallel to the waterfront runs a main street with large shops and behind this is the market containing the small shops of the African traders. A fresh water supply is now being laid and this is dislocating traffic to an even greater degree than is usual. Driving is precarious with cars turning right or left at will, horns sounding continuously and bicycles dodging everywhere. Pavements on the whole are virtually non-existent and pedestrians have to keep from under the wheels of vehicles to the best of their ability. Under these circumstances the accident rate, although high by other standards is surprisingly low for Nigeria. Transport is only by car or taxi, except for the long-distance "mammy wagons" which ply between towns or up-country.

These "mammy wagons" are owned by African women and driven by hired men. They cover long and arduous distances, carrying goods and passengers, and to the African, with the exception of the railway, are the only means of travelling between towns. To the European a car is essential.

Lagos is expanding and considerable slum clearance is now is progress. New substantial buildings, fully air-conditioned office blocks and shops are rising fast with modern houses a little farther out. In a few years at the current rate of progress large areas will have been rebuilt to the standards prevailing in Europe. The main difference being that the houses are built with open spaces in the outside walls to let in the air.

The chief difference between the Northern and Western Regions, apart from the more usual ones, is the great advance now being made in both building and education by the West. Schools are rising in large numbers, primary education is free and secondary education in demand for both boys and girls. Houses are modern and well-built compared with the more traditional ones which, although cool, do not seem to be strong or very durable. Western Nigeria is building to last and cities, such as Lagos and Ibadan testify to this.

ST. EGYDYER
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(*Continued from page 13*)

on the plants. This is where the finest, high-yielding coffee trees are found.

In the good coffee-growing regions the soils are clayey and brown and usually deep. In Kaffa, the PH is 5.4 to 5.6, in Limmu, 5.4, and in Illubabor 6.0 which shows that *arabica* coffee favours an acid soil.

There are many large groves of wild coffee in Ethiopia, particularly in the Bonga, Mizan Teferi and Limmu-Ennarea areas. Here, *arabica* coffee is prevalent and forms part of underwood flora. It requires a certain amount of light, however, and is more common on the slopes where a fairly open high forest has been established. The groves are to be found mostly at elevations of over 1,500 metres where there is plenty of rain for most of the year, and where there is either no dry season or one of short duration.

In general, the soil of coffee groves is humus-producing, clay-sand, brown in colour and very deep. Wild coffee plants often grow close together and it is not unusual to find several to the square metre. Consequently, the plants are thin, elongated and cramped. Productivity is thereby much reduced and it is not surprising that their yield per hectare is only 100 to 200 kg of marketable coffee. In the clearings where there is little or no shade, the tops of the coffee plants are loaded with berries as in a properly tended plantation. The long, thin stems bend under the weight of the fruit and break, and suckers develop; the plants become many-stemmed like the "agobiada" type. Many berries fall to the ground during the ripening period, and so allow for natural reseeding.

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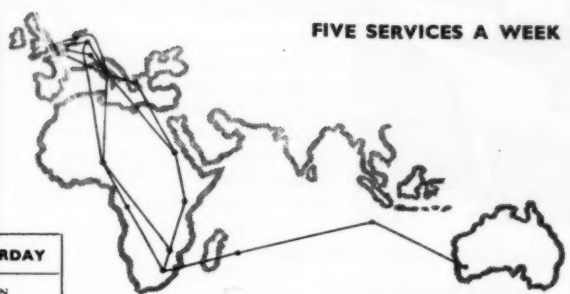

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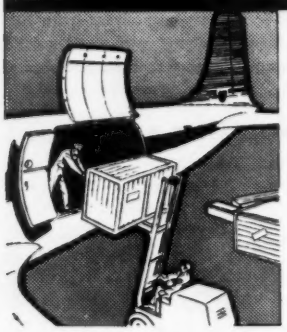

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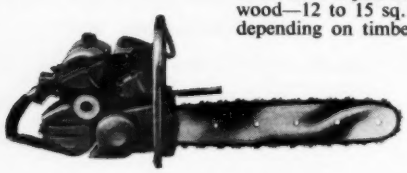

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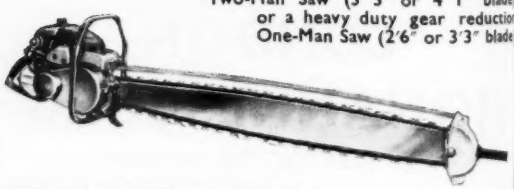

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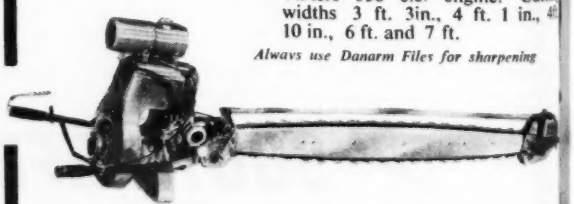

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